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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/791,024	03/02/2004	Cornelis L. G. Ham	PHN 17333A	1273

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EXAMINER	
FETZNER, TIFFANY A	
ART UNIT	PAPER NUMBER
2859	

DATE MAILED: 04/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/791,024	HAM ET AL.	
	Examiner	Art Unit	
	Tiffany A. Fetzner	2859	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *January 24th 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED Final ACTION

1. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

3. **Applicant cannot rely upon the foreign priority papers to overcome this rejection** because a certified English translation of said papers has not been made of record in accordance with 37 CFR 1.55. [See MPEP э 201.15.] Therefore, in the course of the rejections which follow, applicant□s US filing date of March 2nd 2000 is considered to be the priority date of the instant application.

4. The examiner also notes that the effective US priority date of the **Hasson et al.,** reference is earlier than applicant's foreign priority date.

Claim Objections

5. The objection to claim 2 from the October 21st 2004 office action is rescinded in view of the January 24th 2005 amendment of **Claim 2,** which resolves and overcomes the objection. is objected to because of the following informalities:

Response to Arguments

6. Applicant's arguments filed January 24th 2005 have been fully considered but they are not persuasive. Applicant has amended claim 1 as per the January 24th 2005 amendment and response to include the feature that "the device and its immediate vicinity being substantially steady," the examiner notes that the "device" referenced in applicant's amended limitation is the Magnetic resonance device recited earlier in the

claim. Applicant argues on page 9 last paragraph through page 10 first paragraph of the January 24th 2005 amendment and response that the applied **Hasson et al.,** reference fails to recite the amended feature, and teaches away from the amended limitation added by the last amendment of January 24th 2005. The examiner disagrees with applicant and is not persuaded because the portable monitoring system of the **Hasson et al.,** reference [See figure 5] is a portable system device which monitors the polarization level of hyperpolarized gas, provides static magnetic field fluctuation feedback, [See abstract, col. 4 lines 8-63] generates a holding / compensating / correcting magnetic field to maintain the desired magnetic field strength, and includes: hyperpolarized gas (i.e. a magnetic field producing source which generates a main magnetic flux) an NMR coil (i.e. component 75), a pulse excitation generator, transmit and receiving means associated with the NMR coil and the pulse generator, a solenoid generating an adjustable electromagnetic holding field (i.e. component 20), and a signal analyzer which are all arranged is a portable but stationary transport unit 10. [See figures 2 and 5 in combination]. The examiner notes that while the entire system is portable the components which comprise the portable monitoring system of the **Hasson et al.,** reference, (i.e. all of the components listed in figures 2 and 5) are fixed into a specific position within the 'device", such that "the device and its immediate vicinity" remain (i.e. being) "substantially steady,"

7. The examiners main point is that the individual components of the **Hasson et al.,** reference, are geometrically fixed / stationary / "substantially steady" with respect to one another, even though the entire system is being moved, the environment within the device remains constant, while the outer environment through which the system is moved changes and may be subject to temporally varying magnetic fields which could potentially alter, or diminish the static magnetic field produced by the hyperpolarized gas. [See col. 4 lines 8-63] Like applicant, the **Hasson et al.,** reference, compensates for the temporally varying field strength of the main magnetic field produced by the main magnetic field source, of the magnetic resonance / NMR device, and **Hasson et al.,** determines "at least one quantity" (i.e. ***temperature*** col. 4 lines 47-50; col. 13 lines 10-15; col. 18 lines 31-35; col. 18 lines 40-42; **pressure** col. 17 lines 15-25; **current** col. 3

lines 37-36, col. 4 lines 24-51; col. 11 lines 1-3; col. 13 lines 58-63) "which is characteristic of the temperature-dependent magnetic properties of a magnetizable material" (i.e. the temperature of the magnetic coil wire for coils 20,75) "~~which is~~ included as part of the magnetic resonance imaging device and which interacts with the magnetic fields of such device, [See col. 4 lines 47-50; col. 13 lines 10-15; col. 18 lines 31-35; col. 18 lines 40-42; col. 16 lines 41-44; col. 7 line 29 through col. 8 line 30]. The examiner notes that the components of the magnetic resonance device within portable transport / monitoring system component 10 "and its immediate vicinity" remain (i.e. being) "substantially steady," due to the geometry of the components located in fixed positions and the adjustable compensating magnetic holding field which maintains the desired field strength of the main magnetic field, during transport of the device from one location to another regardless of any change in the environments external or internal parameters. Therefore applicant's amended limitation is met by the figures and teachings of the **Hasson et al.,** reference. [See figures 2, 5; abstract, col. 4 lines 8-63 and the entire reference in general.] In **Hasson et al.,** the magnetic field environment, through which the portable NMR transport / monitoring device is moved, may change but "the device and its immediate" internal " vicinity" remain "substantially steady." The feature of maintaining a constant magnetic field, and correcting, for any fluctuations encountered during transport, of a magnetic resonance device is a main point of novelty of the **Hasson et al.,** reference. Therefore, applicant's argued feature of novelty is already present within the prior art of record and fails to distinguish, or define over the **Hasson et al.,** reference as it is currently recited within **amended claim 1**.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. **Claims 1-20** are **finally** rejected under **35 U.S.C. 102 (e)** as being anticipated by **Hasson et al.,** US patent 6,566,875 B1 issued May 20th 2003 originally filed June16th 1999, with an effective US priority date of Feb. 23rd 1999.

10. With respect to **Amended Claim 1**, **Hasson et al.,** teaches " A method of determining a compensation signal" [See abstract, col. 2 lines 25-31; col. 1 lines 20-43; especially col. 3 lines 27-47] "for the compensation of a temporally varying field strength" {See col. 3 lines 27-47; col. 4 lines 23-51; col. 9 lines 2-6;] "of the main magnetic field of a main magnet of a magnetic resonance imaging device" [See col. 9 lines 46-65 where permanent magnets are used; col. 1 lines 20-33] "which also includes at least one gradient field coil for generating a gradient magnetic field" [See internal solenoid coil 20 which generates the adjustable magnetic holding field component 300, col. 9 lines 2-6; and col. 16 lines 29-44 where the holding field 300 produced by coil 20 is a directional magnetic field (i.e. an applied gradient magnetic field)]. "The method comprising: determining at least one quantity" (i.e. ***temperature*** col. 4 lines 47-50; col. 13 lines 10-15; col. 18 lines 31-35; col. 18 lines 40-42; **pressure** col. 17 lines 15-25; **current** col. 3 lines 37-36, col. 4 lines 24-51; col. 11 lines 1-3; col. 13 lines 58-63) "which is characteristic of the temperature-dependent magnetic properties of a magnetizable material" (i.e. the temperature of the magnetic coil wire) "~~which is~~ included as part of the magnetic resonance imaging device and which interacts with the magnetic fields of ~~the~~such device, [See col. 4 lines 47-50; col. 13 lines 10-15; col. 18 lines 31-35; col. 18 lines 40-42; col. 16 lines 41-44; col. 7 line 29 through col. 8 line 30] " the device and its immediate vicinity being substantially steady, [See figures 2, 5; abstract, col. 4 lines 8-63 and the response to arguments presented earlier in this office action] "and, providing the compensation signal on the basis of said characteristic quantity." [See col. 3 lines 11-15, col. 3 lines 27-35; col. 4 lines 30-51 and the entire reference in general.]

11. With respect to **Amended Claim 2**, **Hasson et al.,** teaches "the electric signal" (i.e. the electrical current) "applied to ~~each~~ said at least one gradient magnetic field coil" (i.e. component 20) is determined as one characteristic quantity." [See col. 3 lines 39-46; col. 4 lines 23-51; col. 8 lines 30-48; col. 9 lines 45-65] The same reasons for rejection, that apply to **claim 1** also apply to **claim 2** and need not be reiterated.

12. With respect to **Claim 3**, and corresponding **new claim 15**, which depend respectively from **claims 1**, and **2**, **Hasson et al.,** teaches that "the temperature of the magnetizable material" (i.e. the temperature of the magnetic coil wire) "is determined as one characteristic quantity." [See col. 4 lines 47-50; col. 13 lines 10-15; col. 18 lines 31-35; col. 18 lines 40-42] The same reasons for rejection, that apply to **claims 1, 2** also apply to **claims 3, 15** and need not be reiterated.

13. With respect to **Claim 4**, and corresponding **new claim 16**, which depend respectively from **claims 1**, and **15**, **Hasson et al.,** teaches "the main magnet includes a main magnetic field coil" (i.e. NMR coil components 150, and 75) "having a resistance which is not negligibly small with respect to power dissipation, and wherein a further quantity which is characteristic of the temperature-dependent magnetic properties of the magnetizable material is determined from the electric power dissipated in the main magnetic field coil." [See col. 4 lines 47-51; col. 8 line 60 through col. 10 line 14 col. 13 lines 10-20; col. 18 lines 11-57. The examiner notes that controlling the power and "coil ring down" (i.e. the power dissipation of the current powered coil) indicates that within the reference that the resistance "is not negligibly small with respect to power dissipation".] The same reasons for rejection, that apply to **claims 1, 2, 3, 15** also apply to **claims 4, 16** and need not be reiterated.

14. With respect to **Claim 5**, and corresponding **new claim 18**, which depend respectively from **claims 1**, and **16**, **Hasson et al.,** teaches that "the compensation signal is provided on the basis of a predetermined functional relationship between the temperature-dependent magnetic properties" [See figure 6, col. 4 lines 47-50; col. 11 line 57 through col. 12 line 57; col. 13 lines 10-15; col. 18 lines 31-35; col. 18 lines 40-42] "of the magnetizable material" (i.e. the coil wire) "and each relevant characteristic quantity." [See col. 13 lines 2-37; (i.e. ***temperature*** col. 4 lines 47-50; col. 13 lines 10-15; col. 18 lines 31-35; col. 18 lines 40-42; **pressure** col. 17 lines 15-25; **current** col. 3 lines 37-36, col. 4 lines 24-51; col. 11 lines 1-3; col. 13 lines 58-63)] The same reasons for rejection, that apply to **claims 1, 2, 3, 4, 15, 16** also apply to **claims 5, 18** and need not be reiterated.

15. With respect to **Claim 6**, **Hasson et al.,** teaches that "the relevant functional

relationship is recorded in a look-up table", [See col. 12 line 63 through col. 13 line 20; col. 18 lines 54-56] "the input parameter of which is a representation of each characteristic quantity whereas its output parameter is a representation of the compensation signal." [See figures 7, 10]. The same reasons for rejection, that apply to **claims 1, 2, 3, 4, 5** also apply to **claim 6** and need not be reiterated.

16. With respect to **Claim 7**, **Hasson et al.,** teaches that " the device includes an auxiliary magnetic field coil" (i.e. coil component 20 is an auxiliary magnetic field coil, which also happens to produce a directional gradient) "for the compensation of the field strength of the main magnetic field" produced by the permanent magnets col. 9 line 52, of the **Hasson et al.,** device. [See internal solenoid coil 20 which generates the adjustable magnetic holding field component 300, col. 9 lines 2-6; and col. 16 lines 29-44 where the holding field 300 produced by coil 20 is a directional magnetic field (i.e. an applied gradient magnetic field)]; "and further comprising compensating the main magnetic field by generating an auxiliary magnetic field by means the auxiliary magnetic field coil in conformity with the provided compensation signal." [See col. 9 line 2 through col. 10 line 14; col. 3 lines 4-46; col. 4 lines 24-51] The same reasons for rejection, that apply to **claim 1,** also apply to **claim 7** and need not be reiterated.

17. With respect to **Claim 8**, and corresponding **new claim 19**, which depend respectively from **claims 1**, and **7**, **Hasson et al.,** teaches "the main magnet includes a main magnetic field coil" (i.e. NMR coil components 150, and 75) "having a resistance which is not negligibly small with respect to power dissipation, and further comprising compensating the main magnetic field by controlling the electrical energizing of the main magnetic field coil in conformity with the provided compensation signal." [See col. 3 lines 39-46; col. 4 lines 23-51; col. 8 lines 30-48; col. 9 lines 45-65; col. 13 lines 54-67; col. 14 lines 17-53; col. 18 lines 39-57.] The same reasons for rejection, that apply to **claims 1, 2, 3, 4, 7, 15, 16,** also apply to **claims 8, 19** and need not be reiterated.

18. With respect to **Claim 9**, and corresponding **new claim 20**, which depend respectively from **claims 1**, and **7**, **Hasson et al.,** teaches that the device includes "high frequency (RF) oscillator means for energizing at least one high-frequency (RF) coil, (i.e. RF coil components 150 and 75) "and further comprising adapting during operation

the frequency of the RF oscillator means in conformity with the provided compensation signal." [See col. 10 line 65 through col. 11 line 57 especially col. 11 line 35-36; col. 13 lines 2-37; Figure 10; col. 3 line 4 through col. 4 line 51; col. 7 lines 44-64] The same reasons for rejection, that apply to **claims 1, 2, 3, 4, 7, 15, 16,** also apply to **claims 9, 20** and need not be reiterated.

19. With respect to **Claim 10**, **Hasson et al.,** teaches that "the frequency of the RF oscillator means is adapted prior to the application of one or more gradient magnetic field signals." [See col. 10 line 65 through col. 11 line 57 especially col. 11 line 35-36; col. 13 lines 2-37; Figure 10; col. 3 line 4 through col. 4 line 51; col. 7 lines 44-64; Figures 4, 10; col. 12 lines 7-56; col. 19 line 7 through col. 20 line 33.] The same reasons for rejection, that apply to **claims 1, 9,** also apply to **claim 10** and need not be reiterated.

20. With respect to **Claim 11**, **Hasson et al.,** teaches that "the device includes processor-controlled processing means for the processing of an information signal acquired under the influence of the main magnetic field, and further comprising controlling the processing means in conformity with the provided compensation signal in order to provide a compensated information signal." [See col. 3 line 47 through col. 4 line 5; col. 5 lines 48-60; col. 11 line 57 through col. 13 line 37; col. 19 line 7 through col. 20 line 33.] The same reasons for rejection, that apply to **claim 1,** also apply to **claim 11** and need not be reiterated.

21. With respect to **Claim 12**, **Hasson et al.,** teaches that "variations of the field strength of the main magnetic field are determined and compensated, [See col. 3 lines 26-46; col. 4 lines 24-51; col. 9 lines 2-65; col. 10 line 62 through col. 11 line 30] "if necessary, one or more times during an acquisition period. [See col. 10 line 62 through col. 11 line 30] and the entire reference in general.] The same reasons for rejection, that apply to **claim 1,** also apply to **claim 12** and need not be reiterated.

22. With respect to **Claim 13**, and corresponding **new claim 17**, which depend respectively from **claims 1**, and **16**, **Hasson et al.,** teaches "measuring variations of the field strength of the main magnetic field which are caused by one or more further quantities, including external magnetic fields, atmospheric pressure and mechanical

vibrations", [See col. 17 lines 15-25; col. 3 line 4 through col. 4 line 55; col. 7 line 30 through col. 10 line 14] "and wherein the step of providing further comprises providing the compensation signal from a relevant functional relationship which represents the effect of the one or more further quantities on the main magnetic field." [See figures 7, 10, figure 6 component 670; col. 11 line 31 through col. 13 line 37; col. 14 lines 40-51; col. 18 lines 11-57]. The same reasons for rejection, that apply to **claims 1, 2, 3, 4, 15, 16,** also apply to **claims 13, 17** and need not be reiterated.

23. With respect to **Claim 14**, **Hasson et al.,** teaches and shows "A device for magnetic resonance imaging, comprising: a receiving space for accommodating an object to be imaged",[See figures 1, 2, 5, and 9; col. 1 lines 20-43] The examiner notes that in the **Hasson et al.,** reference the object to be imaged is the hyperpolized gas used in MRI and MR spectroscopic technologies to excite the nuclei of hydrogen molecules present in water protons in a human body, which is imaged on a display. **Hasson et al.,** also teaches and shows "a main magnet for generating a main magnetic field in the receiving space", [See the permanent magnets of col. 9 line 52] "at least one gradient field coil" [See coil component 20; col. 16 lines 29-44 where the magnetic field produced by coil 20 is directional.] "at least one high-frequency (RF) coil" [See excitation coil components, 150 and 75.]

24. Additionally, **Hasson et al.,** teaches "means for determining at least one quantity which is characteristic of the temperature-dependent magnetic properties of a magnetizable material" (i.e. the temperature of the magnetic coil wire) "which is included as part of the magnetic resonance device and which interacts with the magnetic fields of the device", [See col. 4 lines 47-50; col. 13 lines 10-15; col. 18 lines 31-35; col. 18 lines 40-42; col. 16 lines 41-44; col. 7 line 29 through col. 8 line 30] "control means for energizing and controlling the main magnet, the gradient field coil and the RF coil, and are actively coupled to the energizing and control means in order to determine a compensation signal for the compensation of a temporally varying field strength of the main magnetic field, wherein the processing means are arranged to carry out the method claimed in claim 1." [See col. 3 line 4 through col. 4 line 51; col. 8 line 31 through col. 10 line 14; col. 10 line 52 through col. 13 line 37; col. 13 line 50 through col.

15 line 40; col. 18 lines 11-57; col. 19 line 20 through col. 20 line 33.] The same reasons for rejection, that apply to **claim 1,** also apply to **claim 14** and need not be reiterated.

Prior art made of Record

25. The **prior art made of record** and not relied upon is considered pertinent to applicant's disclosure.

A) Lasarkis et al., US patent 5,304,934 issued April 19th 1994 [This reference supports the use of copper or aluminum in the construction of thermal shields, for the purpose of attaining a uniform temperature. See col. 8 lines 45-49]

B) Kruspe et al., US patent 6,114,851 issued September 5th 2000, filed February 12th 1999. The entire reference is important because it suggests an NMR bore-hole application, that uses a compensated magnetic flux, in a temperature-dependent environment.

C) Palkovich et al., US patent 5,551,243 issued September 3rd 1996, which teaches taking temperature measurements of at least one radiation shield in a superconductive magnet.

D) Van Vaals et al., US patent 6,064,206 issued May 16th 2000 filed October 15th 1998.

E) Keller et al., US patent 5,278,503 issued January 11th 1994.

F) Watkins et al., US patent 6,252,405 B1 issued June 26th 2001 originally filed November 15th 1999.

G) Yamaguchi et al., US patent 4,663,592 issued May 5th 1987.

H) Ham et al., US patent 6,371,113 issued May 2004. This reference is the parent application of applicant's instant continuation application, it is noted for a complete record but is not prior art against applicant's claims.

26. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

27. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

28. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tiffany Fetzner whose telephone number is: (571) 272-2241. The examiner can normally be reached on Monday-Thursday from 7:00am to 4:30pm., and on alternate Friday's from 7:00am to 3:30pm.

29. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez, can be reached at (571) 272-2245. The **only official fax phone number** for the organization where this application or proceeding is assigned is **(703) 872-9306**.

Tiffany A. Fetzner

TAF
April 6, 2005

Diego Gutierrez
Supervisory Patent Examiner
Technology Center 2800